

# VOLUME TABLES USED IN CONNECTION WITH THE FOREST SURVEY

PART I LAKE STATES  
PART II KANSAS

LAKE STATES FOREST EXPERIMENT STATION  
UNIVERSITY FARM — ST. PAUL, MINNESOTA  
U. S. DEPARTMENT OF AGRICULTURE  
FOREST SERVICE

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Preliminary Report of the  
LAKE STATES FOREST EXPERIMENT STATION\*

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\*Maintained by the United States Department of Agriculture at University Farm, St. Paul, Minnesota, in cooperation with the University of Minnesota.

Volume Tables for Important Timber Species  
in

1. Michigan and Wisconsin
2. Kansas

When the Forest Survey was begun it was found that no uniform volume tables were available for most of the species in the region. Some of the board-foot volume tables which were at hand were based upon total height, and others were based on merchantable height to a fixed minimum top diameter or a variable top diameter. For some species, tables were entirely lacking or were clearly inaccurate. In tables of cubic-foot volume, likewise, there was much variation, and none of the available tables gave volumes to the utilization limit which was to be used in the Survey. For these reasons, a complete set of volume tables which conform closely to current logging practices was compiled on a uniform basis for all the important timber species in the Lake States and Kansas.

The tables presented in the following pages give volumes by three standards of measure: (1) Board feet, by the Scribner Decimal C log rule;<sup>1/</sup> (2) board feet, by the International (1/4" kerf) log rule (for the Lake States but not for Kansas); and (3) peeled cubic volume of the main stem in conifers (pines and hemlock) and of the main stem and branch wood in hardwoods to a top diameter of 4.0 inches inside bark. Volumes are classified by tree diameters and merchantable height. Only gross volumes are given; that is, no deduction for defect below the usable height has been made.

No specific top diameter is fixed for the board-foot tables. In the construction of these tables the conventional fixed-top or variable fixed-top basis was abandoned, and tree volumes were measured to actual "usable" height as determined by diameter and by position and frequency of branches and defects.

Specifically, merchantable or "usable" height is defined as the length in feet from stump to the point on the main stem of the tree where defect, deformity, or large branches make the wood unsuitable for sawlogs, with the further limitation that no wood less than 8.0 inches in diameter inside bark, in the case of hardwoods, or 6.0 inches in the case of conifers, is considered merchantable. Ordinarily, the merchantable limit of small trees is determined by the minimum top diameter and of larger trees by branches or defect.

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<sup>1/</sup> The Scribner Decimal C rule was curved over diameter and the curved values were used in scaling the sample trees. Table values are board feet rather than tens.

The merchantable heights represent the average of merchantable trees only. No tree was considered merchantable which would not produce at least an 8-foot log of high quality or a 16-foot log of low quality. Trees 18 inches or larger at breast height were required to contain at least one high-quality or two low-quality 16-foot logs.<sup>2/</sup>

These standards of utilization and merchantability conform very closely to the average of the best utilization in current logging operations.

All tables are based on averages of sample trees measured over wide areas. Measurements for the Kansas tables were taken largely in the southeastern part of the State. Tables for the Lake States are based on measurements from many widely distributed logging operations throughout Michigan and Wisconsin. Measurements on many standing trees were obtained by climbing.

For close estimates of specific stands, the applicability of any volume table can be checked by comparing the table values with the measured scale of trees from the area. A comparison of the average form of trees from several districts of the Lake States, however, indicates that the tables may be applied with reasonable accuracy in any locality where the area to be cruised includes a variety of sites and forest conditions. The standards of merchantability above described for merchantable trees and logs necessarily must be used both in measurement of check trees and in the tree tally on the actual cruise.

#### Volume Tables by D.B.H. Only

For convenience in timber estimating, volume tables giving the volume of trees by diameter classes only (for trees of average height) may be compiled from the standard tables by preparation of height-over-diameter curves, based on measurement of the merchantable heights of sample trees selected at random from the area that is being cruised. These curves will indicate what merchantable height may be expected on the average for trees of a given diameter. The volumes read from the accompanying volume tables for the heights corresponding to the curved values will constitute the required volume table. For most timber surveys this practice has much to recommend it in lieu of a tally of trees by diameter and log length.

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<sup>2/</sup> The minimum merchantable sawlog is required to be at least 8 feet long and must be suitable for crating or rough lumber. Although this standard of merchantability determines the minimum quality of sawlog and minimum merchantable height, the latter is not measured in terms of log lengths but is taken to the nearest 2 feet without regard to the manner in which the stem might be bucked up.

Measured height values may be plotted on cross-section paper (vertical axis) over the corresponding diameter (horizontal axis). A curve fitted to the plotted points will form a definite trend, provided that a sufficient number of height measurements is secured for each d.b.h. class. The sample trees should be well distributed over the entire area cruised in order to be representative of the general run of timber.

### Cull in Merchantable Trees

Board-foot tables show gross volumes of merchantable trees. To allow for long butts and other sections of merchantable trees left in the woods and for losses in milling due to sweep, rot, shake, etc., deductions should be developed on the basis of local conditions and utilization practices. The following cull percentages represent the general average of timber stands in the several localities listed:

| Species                   | Upper Michigan |           | Wisconsin |              |
|---------------------------|----------------|-----------|-----------|--------------|
|                           | West half      | East half | Northern  | Southwestern |
|                           |                |           |           |              |
| (Percent of gross volume) |                |           |           |              |
| Sugar maple               | 20             | 19        | 17        | 25           |
| Yellow birch              | 20             | 20        | 22        | 25           |
| Basswood                  | 25             | 21        | 27        | 30           |
| Elms                      | 15             | 21        | 20        | 25           |
| Paper birch               | 20             | 10        | 20        | 20           |
| Soft maples               | 30             | 25        | 25        | 25           |
| Beech                     | 30             | 20        | 30        | --           |
| Oaks                      | 15             | 15        | 9         | 18           |
| Black ash                 | 20             | 20        | 20        | 25           |
| Hickory                   | --             | --        | 15        | 20           |
| Hemlock                   | 25             | 21        | 25        | --           |

No. 4 and poorer lumber was considered as cull in compiling these factors. The percentages, of course, apply only to timber estimates based on the standards of merchantability used in compiling the accompanying volume tables. If logs or trees of better or poorer quality than are represented by the tables are included in volume estimates, a proportionate adjustment in the cull factors would be necessary.

No cull percentages have been compiled for the Plains States.

### Volume of Tops and Limbs

In compiling data for the Survey in Kansas, the division of merchantable cubic volume between the sawlog portion of the tree and the tops and limbs to a 4-inch diameter was computed. The proportions of the total peeled merchantable volume which consist of tops and limbs are:

|                           | Percent of<br>total volume |
|---------------------------|----------------------------|
| American and slippery elm | 48                         |
| Black walnut              | 38                         |
| Bur oak                   | 41                         |
| Cottonwood                | 39                         |
| Green and white ash       | 46                         |
| Hackberry                 | 43                         |
| Hickories                 | 37                         |
| Post oak                  | 41                         |
| Red and pin oak           | 35                         |
| Sycamore                  | 37                         |

These percentages are general averages, applicable only to a considerable volume of timber. They do not apply to trees which are either predominantly smaller or larger than the general run of timber stands in Kansas.



SUGAR MAPLE  
(*Acer saccharum*)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

Scribner

|                     |  | Merchantable Height, above stump - feet |     |     |     |      |      |      |       |
|---------------------|--|-----------------------------------------|-----|-----|-----|------|------|------|-------|
| Diameter            |  |                                         |     |     |     |      |      |      | Basis |
| Breast              |  | 10                                      | 20  | 30  | 40  | 50   | 60   | 70   |       |
| High                |  |                                         |     |     |     |      |      |      |       |
| Volume - board feet |  |                                         |     |     |     |      |      |      |       |
| Inches              |  |                                         |     |     |     |      |      |      | Trees |
| 10                  |  | 19                                      | 37  | 50  | 60  | 70   |      |      | 68    |
| 12                  |  | 33                                      | 56  | 76  | 89  | 105  |      |      | 159   |
| 14                  |  | 48                                      | 82  | 110 | 132 | 152  | 172  |      | 181   |
| 16                  |  | 65                                      | 110 | 148 | 185 | 215  | 238  | 257  | 181   |
| 18                  |  |                                         | 142 | 195 | 249 | 290  | 320  | 343  | 154   |
| 20                  |  |                                         | 185 | 255 | 322 | 375  | 415  | 440  | 119   |
| 22                  |  |                                         | 234 | 320 | 400 | 470  | 520  | 555  | 89    |
| 24                  |  |                                         | 295 | 403 | 495 | 580  | 650  | 700  | 63    |
| 26                  |  |                                         | 350 | 490 | 608 | 710  | 795  | 860  | 21    |
| 28                  |  |                                         |     | 577 | 710 | 833  | 938  | 1010 | 22    |
| 30                  |  |                                         |     | 660 | 810 | 950  | 1065 | 1155 | 8     |
| 32                  |  |                                         |     | 740 | 904 | 1060 | 1190 | 1292 | 5     |
| 34                  |  |                                         |     | 812 | 990 | 1160 | 1304 | 1420 | 2     |
| Basis               |  | 42                                      | 182 | 276 | 366 | 479  | 525  | 52   | 1072  |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.



SUGAR MAPLE  
(*Acer saccharum*)

Wisconsin - Michigan

Peeled Merchantable Volume

1936

Gevorkiantz, Moser, and Danforth

Cubic Feet

| Merchantable Height, above stump - feet |      |       |       |       |       |         | Basis |
|-----------------------------------------|------|-------|-------|-------|-------|---------|-------|
| Diameter<br>Breast<br>High              | 10   | 20    | 30    | 40    | 50    | 60      |       |
| Volume. - cubic feet                    |      |       |       |       |       |         |       |
| Inches                                  |      |       |       |       |       |         | Trees |
| 10                                      | 10.4 | 13.4  | 16.3  | 18.3  | 19.3  | 20.4    | 68    |
| 12                                      | 15.3 | 20.8  | 22.8  | 25.5  | 27.3  | 29.3    | 159   |
| 14                                      | 21.0 | 27.4  | 30.8  | 34.7  | 37.3  | 40.8    | 181   |
| 16                                      | 28.1 | 34.9  | 40.9  | 45.4  | 49.0  | 53.1    | 181   |
| 18                                      | 36.3 | 45.8  | 52.0  | 57.3  | 62.6  | 68.7    | 154   |
| 20                                      | 45.9 | 58.6  | 64.7  | 71.8  | 78.2  | 86.1    | 119   |
| 22                                      | 59.1 | 73.3  | 79.9  | 87.9  | 95.9  | 106.2   | 89    |
| 24                                      |      | 91.3  | 96.3  | 106.1 | 115.8 | 128.7   | 63    |
| 26                                      |      | 112.3 | 115.0 | 126.0 | 137.9 | 154.2   | 21    |
| 28                                      |      |       |       | 146.5 | 156.5 |         | 22    |
| 30                                      |      |       |       | 167.5 | 178.0 |         | 8     |
| 32                                      |      |       |       | 188.5 | 200.0 |         | 5     |
| 34                                      |      |       |       | 210.0 | 223.5 |         | 2     |
| Basis                                   | 42   | 182   | 276   | 366   | 179   | 25<br>7 | 1072  |

Volume above stump, including peeled main stem and branch to a top diameter of 4.0 inches inside bark. Merchantable height is determined by usable sawtimber top which is defined as the point on the stem at which merchantability for sawtimber is limited by branches, defect, deformity or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H.. 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

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BASSWOOD  
(*Tilia glabra*)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

International  $\frac{1}{4}$ "

| Merchantable Height, above stump - feet |    |     |     |      |      |      |      | Basis |
|-----------------------------------------|----|-----|-----|------|------|------|------|-------|
| Diameter<br>Breast<br>High              | 10 | 20  | 30  | 40   | 50   | 60   | 70   |       |
| Volume - board feet                     |    |     |     |      |      |      |      |       |
| Inches                                  |    |     |     |      |      |      |      | Trees |
| 10                                      | 21 | 40  | 55  | 65   |      |      |      | 56    |
| 12                                      | 37 | 63  | 85  | 100  | 115  | 130  |      | 101   |
| 14                                      | 54 | 91  | 123 | 148  | 172  | 193  | 208  | 100   |
| 16                                      | 68 | 120 | 161 | 204  | 240  | 260  | 280  | 72    |
| 18                                      | 85 | 155 | 210 | 268  | 313  | 344  | 368  | 46    |
| 20                                      |    | 193 | 265 | 337  | 395  | 435  | 464  | 31    |
| 22                                      |    | 244 | 330 | 417  | 488  | 545  | 580  | 22    |
| 24                                      |    | 296 | 406 | 500  | 587  | 657  | 708  | 15    |
| 26                                      |    | 342 | 480 | 595  | 698  | 780  | 845  | 10    |
| 28                                      |    |     | 570 | 700  | 822  | 925  | 1003 | 6     |
| 30                                      |    |     | 659 | 804  | 945  | 1063 | 1153 | 2     |
| 32                                      |    |     |     | 920  | 1082 | 1215 | 1323 | 2     |
| 34                                      |    |     |     | 1039 | 1215 | 1360 | 1483 | 1     |
| Basis                                   | 49 | 102 | 121 | 92   | 50   | 42   | 8    | 464   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.



YELLOW BIRCH  
(*Betula lutea*)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

International  $\frac{1}{4}$ "

| Merchantable Height, above stump -- feet |     |     |     |     |      |      |      | Basis |
|------------------------------------------|-----|-----|-----|-----|------|------|------|-------|
| Diameter<br>Breast<br>High               | 10  | 20  | 30  | 40  | 50   | 60   | 70   |       |
| Volume -- board feet                     |     |     |     |     |      |      |      |       |
| Inches                                   |     |     |     |     |      |      |      | Trees |
| 10                                       | 24  | 42  | 58  | 68  | 78   |      |      | 51    |
| 12                                       | 40  | 65  | 90  | 106 | 126  |      |      | 81    |
| 14                                       | 53  | 93  | 125 | 157 | 184  |      |      | 93    |
| 16                                       | 70  | 124 | 170 | 216 | 252  | 278  |      | 78    |
| 18                                       | 89  | 163 | 221 | 281 | 328  | 364  |      | 71    |
| 20                                       | 110 | 203 | 280 | 352 | 413  | 452  |      | 47    |
| 22                                       | 135 | 247 | 343 | 425 | 498  | 555  |      | 34    |
| 24                                       |     | 295 | 411 | 504 | 593  | 659  | 708  | 28    |
| 26                                       |     | 342 | 480 | 595 | 698  | 780  | 845  | 17    |
| 28                                       |     | 398 | 555 | 685 | 803  | 905  | 980  | 6     |
| 30                                       |     | 455 | 640 | 780 | 918  | 1032 | 1120 | 5     |
| 32                                       |     | 513 | 718 | 875 | 1030 | 1157 | 1260 | 4     |
| Basis                                    | 30  | 120 | 183 | 154 | 27   | 1    |      | 515   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 8.10 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.



ELM  
(*Ulmus americana*)

Wisconsin - Michigan

Peeled Merchantable Volume

1936

Gevorkiantz, Moser, and Danforth

Cubic Feet

| Merchantable Height, above stump - feet |      |       |       |       |       |       | Basis |
|-----------------------------------------|------|-------|-------|-------|-------|-------|-------|
| Diameter<br>Breast<br>High              | 10   | 20    | 30    | 40    | 50    | 60    |       |
| Volume - cubic feet                     |      |       |       |       |       |       |       |
| Inches                                  |      |       |       |       |       |       | Trees |
| 10                                      | 11.1 | 13.9  | 16.7  | 19.4  | 20.3  | 21.9  | 38    |
| 12                                      | 16.5 | 21.3  | 23.7  | 27.2  | 28.7  | 31.7  | 101   |
| 14                                      | 23.0 | 27.9  | 31.7  | 36.8  | 39.1  | 43.1  | 99    |
| 16                                      | 30.3 | 35.7  | 42.4  | 48.2  | 51.6  | 57.8  | 70    |
| 18                                      | 39.5 | 47.0  | 54.1  | 61.3  | 66.1  | 74.5  | 65    |
| 20                                      | 50.1 | 60.2  | 67.2  | 76.7  | 82.3  | 93.6  | 37    |
| 22                                      |      | 75.1  | 82.9  | 94.3  | 101.4 | 115.6 | 23    |
| 24                                      |      | 94.0  | 100.4 | 113.4 | 122.3 | 140.4 | 19    |
| 26                                      |      | 115.5 | 125.8 | 135.0 | 145.7 | 168.6 | 19    |
| 28                                      |      | 139.1 | 149.2 | 158.8 | 172.2 | 199.9 | 7     |
| 30                                      |      | 165.9 | 175.2 | 185.6 | 201.2 | 233.9 | 5     |
| 32                                      |      |       | 205.0 | 214.5 | 231.5 |       | 5     |
| 34                                      |      |       | 236.0 | 246.0 | 264.5 |       | 1     |
| Basis                                   | 49   | 129   | 126   | 118   | 49    | 18    | 489   |

Volume above stump, including peeled main stem and branch to a top diameter of 4.0 inches inside bark. Merchantable height is determined by usable sawtimber top which is defined as the point on the stem at which merchantability for sawtimber is limited by branches, defect, deformity or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H.. 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and north-Michigan.

Block indicates extent of original data.

ELM  
(Ulmus americana)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

Scribner

|                     |  | Merchantable Height, above stump - feet |     |     |      |      |      |      |       |
|---------------------|--|-----------------------------------------|-----|-----|------|------|------|------|-------|
| Diameter            |  |                                         |     |     |      |      |      |      | Basis |
| Breast              |  | 10                                      | 20  | 30  | 40   | 50   | 60   | 70   |       |
| High                |  |                                         |     |     |      |      |      |      |       |
| Volume - board feet |  |                                         |     |     |      |      |      |      |       |
| Inches              |  |                                         |     |     |      |      |      |      | Trees |
| 10                  |  | 18                                      | 36  | 48  | 57   |      |      |      | 38    |
| 12                  |  | 33                                      | 57  | 77  | 91   | 107  |      |      | 101   |
| 14                  |  | 50                                      | 85  | 114 | 137  | 161  | 179  |      | 99    |
| 16                  |  | 67                                      | 116 | 156 | 194  | 230  | 253  |      | 70    |
| 18                  |  |                                         | 150 | 206 | 263  | 305  | 338  | 362  | 65    |
| 20                  |  |                                         | 195 | 267 | 337  | 393  | 435  | 463  | 37    |
| 22                  |  |                                         | 245 | 335 | 415  | 488  | 543  | 582  | 23    |
| 24                  |  |                                         | 297 | 412 | 507  | 597  | 670  | 723  | 19    |
| 26                  |  |                                         | 355 | 494 | 610  | 715  | 800  | 865  | 19    |
| 28                  |  |                                         | 420 | 586 | 720  | 845  | 950  | 1030 | 7     |
| 30                  |  |                                         | 490 | 685 | 838  | 980  | 1105 | 1200 | 5     |
| 32                  |  |                                         | 563 | 785 | 960  | 1124 | 1260 | 1372 | 5     |
| 34                  |  |                                         |     |     | 1090 | 1270 | 1430 | 1555 | 1     |
|                     |  |                                         |     |     |      |      |      |      |       |
| Basis               |  | 49                                      | 129 | 126 | 118  | 49   | 17   | 1    | 489   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

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AMERICAN & SLIPPERY ELM  
(*Ulmus americana* & *Ulmus fulva*)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

International  $\frac{1}{4}$ "

| Merchantable Height, above stump - feet |     |     |     |      |      |      |      | Basis |
|-----------------------------------------|-----|-----|-----|------|------|------|------|-------|
| Diameter<br>Breast<br>High              | 10  | 20  | 30  | 40   | 50   | 60   | 70   |       |
| Volume - board feet                     |     |     |     |      |      |      |      |       |
| Inches                                  |     |     |     |      |      |      |      | Trees |
| 10                                      | 20  | 38  | 52  | 62   |      |      |      | 38    |
| 12                                      | 37  | 63  | 85  | 100  | 115  |      |      | 101   |
| 14                                      | 52  | 94  | 127 | 154  | 181  | 200  |      | 99    |
| 16                                      | 70  | 124 | 170 | 216  | 252  | 278  |      | 70    |
| 18                                      | 90  | 163 | 224 | 284  | 334  | 368  | 393  | 65    |
| 20                                      | 114 | 208 | 287 | 360  | 422  | 467  | 497  | 37    |
| 22                                      |     | 260 | 358 | 443  | 518  | 579  | 620  | 23    |
| 24                                      |     | 310 | 430 | 535  | 625  | 700  | 755  | 19    |
| 26                                      |     | 371 | 515 | 638  | 748  | 840  | 907  | 19    |
| 28                                      |     | 435 | 610 | 745  | 875  | 988  | 1068 | 7     |
| 30                                      |     | 502 | 703 | 858  | 1010 | 1133 | 1233 | 5     |
| 32                                      |     | 578 | 802 | 980  | 1149 | 1288 | 1403 | 5     |
| 34                                      |     |     |     | 1105 | 1295 | 1445 | 1565 | 1     |
| 36                                      |     |     |     | 1240 | 1435 | 1610 | 1760 |       |
| Basis                                   | 49  | 129 | 126 | 118  | 49   | 17   | 1    | 489   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.



BEECH  
(*Fagus grandifolia*)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

International  $\frac{1}{4}$ "

Merchantable Height, above stump - feet

| Diameter<br>Breast<br>High | 10 | 20 | 30 | 40 | 50 | 60 | 70 | Basis |
|----------------------------|----|----|----|----|----|----|----|-------|
|----------------------------|----|----|----|----|----|----|----|-------|

Volume - board feet

| Inches |    |     |     |     |     |      |      | Trees |
|--------|----|-----|-----|-----|-----|------|------|-------|
| 10     | 29 | 51  | 71  | 80  | 93  |      |      | 42    |
| 12     | 46 | 78  | 105 | 125 | 146 | 164  |      | 76    |
| 14     | 65 | 111 | 150 | 188 | 218 | 242  |      | 107   |
| 16     | 81 | 146 | 201 | 256 | 300 | 330  | 353  | 72    |
| 18     |    | 189 | 260 | 330 | 385 | 425  | 452  | 55    |
| 20     |    | 242 | 332 | 412 | 485 | 535  | 575  | 29    |
| 22     |    | 300 | 411 | 504 | 593 | 659  | 708  | 14    |
| 24     |    | 355 | 493 | 612 | 715 | 802  | 868  | 7     |
| 26     |    | 422 | 587 | 721 | 847 | 950  | 1030 | 2     |
| 28     |    |     | 690 | 843 | 988 | 1110 | 1208 | 1     |
| Basis  | 14 | 69  | 114 | 158 | 45  | 4    | 1    | 405   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.

BEECH  
(*Fagus grandifolia*)

Wisconsin - Michigan

Peeled Merchantable Volume

1936

Gevorkiantz, Moser, and Danforth

Cubic Feet

| Merchantable Height, above stump - feet |       |       |       |       |       |       | Basis |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| Diameter<br>Breast<br>High              | 10    | 20    | 30    | 40    | 50    | 60    |       |
| Volume - cubic feet                     |       |       |       |       |       |       |       |
| Inches                                  |       |       |       |       |       |       | Trees |
| 10                                      | 10.5  | 16.8  | 18.5  | 21.8  | 22.7  | 23.6  | 42    |
| 12                                      | 15.9  | 23.1  | 27.2  | 30.9  | 32.6  | 34.0  | 76    |
| 14                                      | 22.0  | 30.2  | 36.4  | 42.1  | 44.3  | 46.6  | 107   |
| 16                                      | 28.9  | 39.8  | 48.1  | 55.0  | 58.6  | 62.7  | 72    |
| 18                                      | 37.8  | 52.8  | 61.4  | 70.4  | 75.2  | 80.6  | 55    |
| 20                                      | 47.7  | 67.7  | 77.3  | 88.6  | 93.9  | 101.7 | 29    |
| 22                                      | 62.1  | 85.0  | 95.1  | 108.4 | 115.5 | 125.3 | 14    |
| 24                                      | 80.8  | 106.5 | 115.4 | 130.7 | 139.6 | 153.5 | 7     |
| 26                                      | 108.6 | 130.8 | 133.0 | 149.6 | 167.0 | 183.4 | 2     |
| 28                                      |       | 157.7 | 159.2 | 184.2 | 197.3 | 217.5 | 1     |
| Basis                                   | 14    | 69    | 114   | 158   | 45    | 5     | 405   |

Volume above stump, including peeled main stem and branch to a top diameter of 4.0 inches inside bark. Merchantable height is determined by usable sawtimber top which is defined as the point on the stem at which merchantability for sawtimber is limited by branches, defect, deformity or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.

HICKORIES  
(Hicoria, sp.)

Wisconsin - Michigan

Peeled Merchantable Volume

Gevorkiantz, Moser, and Danforth Cubic Feet

|                     |  | Merchantable Height, above stump - feet |      |      |      |      |       |
|---------------------|--|-----------------------------------------|------|------|------|------|-------|
| Diameter            |  |                                         |      |      |      |      | Basis |
| Breast              |  |                                         |      |      |      |      |       |
| High                |  | 10                                      | 20   | 30   | 40   | 50   |       |
| Volume - cubic feet |  |                                         |      |      |      |      |       |
| Inches              |  |                                         |      |      |      |      | Trees |
| 10                  |  | 10.3                                    | 13.3 | 16.2 | 20.7 | 21.7 | 18    |
| 12                  |  | 14.9                                    | 21.1 | 24.8 | 29.1 | 31.0 | 32    |
| 14                  |  | 20.3                                    | 27.9 | 33.2 | 39.8 | 42.3 | 15    |
| 16                  |  | 27.0                                    | 35.5 | 44.0 | 51.9 | 55.7 | 3     |
| 18                  |  | 34.5                                    | 46.4 | 56.2 | 66.2 | 71.6 |       |
| Basis               |  | 11                                      | 28   | 24   | 5    |      | 68    |

Volume above stump, including peeled main stem and branch to a top diameter of 4.0 inches inside bark. Merchantable height is determined by usable sawtimber top which is defined as the point on the stem at which merchantability for sawtimber is limited by branches, defect, deformity or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H.. 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.







RED MAPLE AND SILVER MAPLE  
(*Acer rubrum* and *Acer saccharinum*)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

International  $\frac{1}{4}$ "

|                     |  | Merchantable Height, above stump - feet |     |     |      |      |      |      |       |
|---------------------|--|-----------------------------------------|-----|-----|------|------|------|------|-------|
| Diameter            |  |                                         |     |     |      |      |      |      | Basis |
| Breast              |  | 10                                      | 20  | 30  | 40   | 50   | 60   | 70   |       |
| High                |  |                                         |     |     |      |      |      |      |       |
| Volume - board feet |  |                                         |     |     |      |      |      |      |       |
| Inches              |  |                                         |     |     |      |      |      |      | Trees |
| 10                  |  | 26                                      | 47  | 63  | 75   |      |      |      | 46    |
| 12                  |  | 37                                      | 63  | 85  | 100  | 115  | 130  |      | 72    |
| 14                  |  | 51                                      | 88  | 118 | 142  | 166  | 186  |      | 79    |
| 16                  |  | 68                                      | 120 | 161 | 204  | 240  | 260  |      | 57    |
| 18                  |  | 87                                      | 158 | 217 | 277  | 325  | 357  | 380  | 37    |
| 20                  |  | 114                                     | 208 | 287 | 360  | 422  | 467  | 497  | 24    |
| 22                  |  |                                         | 268 | 369 | 455  | 535  | 595  | 640  | 8     |
| 24                  |  |                                         | 335 | 460 | 572  | 673  | 754  | 815  | 5     |
| 26                  |  |                                         | 408 | 570 | 700  | 822  | 925  | 1003 | 2     |
| 28                  |  |                                         | 496 | 695 | 850  | 995  | 1120 | 1217 |       |
| 30                  |  |                                         |     | 830 | 1012 | 1183 | 1328 | 1445 | 1     |
| Basis               |  | 39                                      | 95  | 119 | 56   | 17   | 5    |      | 331   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, defect, deformity or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.



RED AND WHITE OAKS  
(*Quercus borealis* and *Quercus alba*)

Wisconsin - Michigan

Peeled Merchantable Volume

1936

Gevorkiantz, Moser, and Danforth

Cubic Feet

| Merchantable Height, above stump - feet |      |       |       |       |       |       | Basis |
|-----------------------------------------|------|-------|-------|-------|-------|-------|-------|
| Diameter<br>Breast<br>High              | 10   | 20    | 30    | 40    | 50    | 60    |       |
| Volume - cubic feet                     |      |       |       |       |       |       |       |
| Inches                                  |      |       |       |       |       |       | Trees |
| 10                                      | 10.5 | 13.1  | 15.7  |       | 17.7  | 18.5  | 119   |
| 12                                      | 15.5 | 19.9  | 21.8  | 24.7  | 25.0  | 26.1  | 208   |
| 14                                      | 21.5 | 26.2  | 29.7  | 33.4  | 34.1  | 36.7  | 171   |
| 16                                      | 28.5 | 33.6  | 38.8  | 43.7  | 44.6  | 47.1  | 116   |
| 18                                      | 36.9 | 43.2  | 49.4  | 55.3  | 56.9  | 61.3  | 45    |
| 20                                      | 46.5 | 55.6  | 61.4  | 68.9  | 71.2  | 76.8  | 26    |
| 22                                      |      | 69.5  | 75.7  | 84.3  | 88.7  | 94.3  | 11    |
| 24                                      |      | 85.8  | 91.4  | 101.8 | 108.9 | 114.5 | 4     |
| 26                                      |      | 105.8 | 109.2 | 120.9 | 128.6 | 136.8 | 3     |
| 28                                      |      | 127.8 | 134.5 | 148.1 | 152.7 | 161.9 | 1     |
| 30                                      |      | 152.0 | 158.7 | 168.8 | 177.5 | 189.8 | 2     |
| 32                                      |      |       | 190.0 | 198.5 |       |       |       |
| 34                                      |      |       | 225.0 | 231.5 |       |       | 1     |
| Basis                                   | 122  | 295   | 206   | 77    | 5     | 2     | 707   |

Volume above stump, including peeled main stem and branch to a top diameter of 4.0 inches inside bark. Merchantable height is determined by usable sawtimber top which is defined as the point on the stem at which merchantability for sawtimber is limited by branches, defect, deformity or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.



RED OAK AND WHITE OAK  
(*Quercus borealis* and *Quercus alba*)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

International  $\frac{1}{4}$ "

| Merchantable Height, above stump feet |     |     |     |      |      |      |      | Basis |
|---------------------------------------|-----|-----|-----|------|------|------|------|-------|
| Diameter                              | 10  | 20  | 30  | 40   | 50   | 60   | 70   |       |
| Breast<br>High                        |     |     |     |      |      |      |      |       |
| Volume - board feet                   |     |     |     |      |      |      |      |       |
| Inches                                |     |     |     |      |      |      |      | Trees |
| 10                                    | 24  | 42  | 58  | 68   |      |      |      | 119   |
| 12                                    | 35  | 61  | 81  | 96   | 114  |      |      | 208   |
| 14                                    | 51  | 87  | 116 | 140  | 162  |      |      | 171   |
| 16                                    | 67  | 116 | 156 | 197  | 227  |      |      | 116   |
| 18                                    | 83  | 150 | 206 | 263  | 308  | 346  |      | 45    |
| 20                                    | 105 | 193 | 265 | 337  | 395  | 435  | 464  | 26    |
| 22                                    |     | 244 | 330 | 417  | 488  | 545  | 580  | 11    |
| 24                                    |     | 296 | 406 | 500  | 587  | 657  | 708  | 4     |
| 26                                    |     | 350 | 484 | 602  | 701  | 789  | 850  | 3     |
| 28                                    |     | 415 | 578 | 710  | 835  | 935  | 1012 | 1     |
| 30                                    |     | 483 | 675 | 825  | 968  | 1088 | 1170 | 2     |
| 32                                    |     | 545 | 760 | 930  | 1088 | 1222 | 1330 |       |
| 34                                    |     |     | 860 | 1050 | 1230 | 1380 | 1500 | 1     |
| Basis                                 | 122 | 295 | 206 | 77   | 5    | 2    |      | 707   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.







BLACK ASH  
(Fraxinus nigra)

Wisconsin - Michigan

Peeled Merchantable Volume

1936

Gevorkiantz, Moser, and Danforth

Cubic Feet

| Merchantable Height, above stump - feet |      |       |       |       |       |       |       |
|-----------------------------------------|------|-------|-------|-------|-------|-------|-------|
| Diameter                                |      |       |       |       |       |       | Basis |
| Breast                                  | 10   | 20    | 30    | 40    | 50    | 60    |       |
| High                                    |      |       |       |       |       |       |       |
| Volume - cubic feet                     |      |       |       |       |       |       |       |
| Inches                                  |      |       |       |       |       |       | Trees |
| 10                                      | 10.5 | 13.2  | 15.9  | 18.7  | 19.4  | 20.9  | 30    |
| 12                                      | 15.9 | 20.2  | 22.1  | 26.0  | 27.4  | 30.1  | 51    |
| 14                                      | 22.0 | 26.7  | 29.9  | 35.3  | 36.4  | 41.9  | 36    |
| 16                                      | 28.9 | 34.2  | 39.2  | 46.3  | 48.0  | 54.6  | 9     |
| 18                                      | 37.8 | 44.2  | 50.0  | 58.5  | 62.9  | 70.5  | 4     |
| 20                                      | 47.7 | 56.8  | 62.3  | 73.3  | 78.5  | 88.5  | 3     |
| 22                                      |      | 73.1  | 76.7  | 89.8  | 96.4  | 109.3 | 1     |
| 24                                      |      | 87.8  | 92.7  | 108.5 | 116.4 | 132.6 | 1     |
| 26                                      |      | 108.5 | 111.6 | 129.0 | 138.6 | 158.9 |       |
| Basis                                   | 11   | 51    | 52    | 18    | 2     | 1     | 135   |

Volume above stump, including peeled main stem and branch to a top diameter of 4.0 inches inside bark. Merchantable height is determined by usable sawtimber top which is defined as the point on the stem at which merchantability for sawtimber is limited by branches, defect, deformity or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.

BLACK ASH  
(*Fraxinus nigra*)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

Scribner

| Merchantable Height, above stump - feet |    |     |     |     |     |     |       |
|-----------------------------------------|----|-----|-----|-----|-----|-----|-------|
| Diameter                                |    |     |     |     |     |     | Basis |
| Breast                                  | 10 | 20  | 30  | 40  | 50  | 60  |       |
| High                                    |    |     |     |     |     |     |       |
| Volume - board feet                     |    |     |     |     |     |     |       |
| Inches                                  |    |     |     |     |     |     | Trees |
| 10                                      | 20 | 36  | 48  | 57  | 65  |     | 30    |
| 12                                      | 30 | 52  | 73  | 86  | 100 |     | 51    |
| 14                                      | 46 | 79  | 106 | 126 | 148 |     | 36    |
| 16                                      | 65 | 110 | 148 | 185 | 216 | 238 | 9     |
| 18                                      |    | 146 | 201 | 256 | 299 | 330 | 4     |
| 20                                      |    | 195 | 265 | 335 | 394 | 435 | 3     |
| 22                                      |    | 250 | 343 | 425 | 500 | 555 | 1     |
| 24                                      |    |     | 430 | 530 | 620 | 695 | 1     |
| 26                                      |    |     | 530 | 650 | 760 | 855 |       |
| Basis                                   | 11 | 51  | 52  | 18  | 2   | 1   | 135   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.

BLACK ASH  
(*Fraxinus nigra*)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

International  $\frac{1}{4}$ "

| Merchantable Height, above stump - feet |    |     |     |     |     |     | Basis |
|-----------------------------------------|----|-----|-----|-----|-----|-----|-------|
| Diameter<br>Breast<br>High              | 10 | 20  | 30  | 40  | 50  | 60  |       |
| Volume - board feet                     |    |     |     |     |     |     |       |
| Inches                                  |    |     |     |     |     |     | Trees |
| 10                                      | 25 | 45  | 60  | 71  | 82  |     | 30    |
| 12                                      | 38 | 64  | 86  | 102 | 118 |     | 51    |
| 14                                      | 54 | 91  | 123 | 148 | 172 |     | 36    |
| 16                                      | 69 | 122 | 165 | 210 | 245 | 270 | 9     |
| 18                                      |    | 161 | 221 | 281 | 328 | 364 | 4     |
| 20                                      |    | 210 | 288 | 365 | 425 | 472 | 3     |
| 22                                      |    | 268 | 369 | 455 | 535 | 595 | 1     |
| 24                                      |    |     | 447 | 560 | 648 | 728 | 1     |
| 26                                      |    |     | 540 | 670 |     |     |       |
| Basis                                   | 11 | 51  | 52  | 18  | 2   | 1   | 135   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 8.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.

HEMLOCK  
(*Tsuga canadensis*)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

International  $\frac{1}{4}$ "

| Merchantable Height, above stump - feet |    |     |     |      |      |      |      | Basis |
|-----------------------------------------|----|-----|-----|------|------|------|------|-------|
| Diameter<br>Breast<br>High              | 10 | 20  | 30  | 40   | 50   | 60   | 70   |       |
| Volume - board feet                     |    |     |     |      |      |      |      |       |
| Inches                                  |    |     |     |      |      |      |      | Trees |
| 10                                      | 21 | 40  | 55  | 65   | 76   |      |      | 67    |
| 12                                      | 35 | 61  | 81  | 96   | 112  | 125  |      | 97    |
| 14                                      | 50 | 85  | 114 | 137  | 159  | 179  | 193  | 117   |
| 16                                      | 66 | 112 | 152 | 191  | 222  | 245  | 265  | 107   |
| 18                                      | 79 | 142 | 195 | 249  | 290  | 320  | 343  | 76    |
| 20                                      |    | 182 | 250 | 318  | 370  | 410  | 436  | 69    |
| 22                                      |    | 229 | 315 | 390  | 460  | 510  | 550  | 44    |
| 24                                      |    | 283 | 392 | 480  | 565  | 632  | 680  | 29    |
| 26                                      |    | 340 | 470 | 588  | 685  | 768  | 830  | 29    |
| 28                                      |    | 405 | 563 | 693  | 801  | 910  | 989  | 12    |
| 30                                      |    |     | 660 | 808  | 948  | 1065 | 1155 | 8     |
| 32                                      |    |     |     | 930  | 1090 | 1221 | 1330 | 1     |
| 34                                      |    |     |     | 1060 | 1238 | 1389 | 1510 | 1     |
| 36                                      |    |     |     | 1190 | 1389 | 1550 | 1693 | 1     |
| Basis                                   | 6  | 120 | 175 | 134  | 130  | 75   | 18   | 658   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 6.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.

HEMLOCK  
(*Tsuga canadensis*)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

Scribner

| Merchantable Height, above stump -- feet |     |     |     |      |      |      |      | Basis |
|------------------------------------------|-----|-----|-----|------|------|------|------|-------|
| Diameter<br>Breast<br>High               | 10  | 20  | 30  | 40   | 50   | 60   | 70   |       |
| Volume -- board feet                     |     |     |     |      |      |      |      |       |
| Inches                                   |     |     |     |      |      |      |      | Trees |
| 10                                       | 15  | 30  | 41  | 49   | 57   |      |      | 67    |
| 12                                       | 28  | 49  | 66  | 79   | 90   | 101  |      | 97    |
| 14                                       | 43  | 75  | 98  | 116  | 136  | 152  | 165  | 117   |
| 16                                       | 60  | 103 | 138 | 169  | 198  | 219  | 235  | 107   |
| 18                                       | 74  | 132 | 181 | 229  | 267  | 295  | 315  | 76    |
| 20                                       | 93  | 170 | 232 | 296  | 345  | 380  | 405  | 69    |
| 22                                       | 115 | 215 | 293 | 367  | 428  | 472  | 505  | 44    |
| 24                                       | 143 | 265 | 360 | 445  | 523  | 583  | 625  | 29    |
| 26                                       | 173 | 310 | 430 | 540  | 625  | 700  | 754  | 29    |
| 28                                       |     | 370 | 511 | 633  | 741  | 830  | 898  | 12    |
| 30                                       |     | 432 | 600 | 738  | 865  | 972  | 1054 | 8     |
| 32                                       |     |     | 695 | 850  | 995  | 1120 | 1216 | 1     |
| 34                                       |     |     |     | 965  | 1132 | 1270 | 1380 | 1     |
| 36                                       |     |     |     | 1090 | 1273 | 1428 | 1555 | 1     |
| Basis                                    | 6   | 120 | 175 | 134  | 130  | 75   | 18   | 658   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 6.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.

HEMLOCK  
(*Tsuga canadensis*)

Wisconsin - Michigan

Peeled Merchantable Volume

1936

Gevorkiantz, Moser, and Danforth

Cubic Feet

| Merchantable Height, above stump - feet |       |        |        |        |        |        |        | Basis |
|-----------------------------------------|-------|--------|--------|--------|--------|--------|--------|-------|
| Diameter<br>Breast<br>High              | 10    | 20     | 30     | 40     | 50     | 60     | 70     |       |
| Volume - cubic feet                     |       |        |        |        |        |        |        |       |
| Inches                                  |       |        |        |        |        |        |        | Trees |
| 10                                      | 6.76  | 10.66  | 13.85  | 16.67  | 19.80  | 23.14  |        | 67    |
| 12                                      | 9.06  | 14.26  | 18.54  | 22.37  | 26.52  | 30.96  |        | 97    |
| 14                                      | 11.50 | 18.12  | 23.59  | 28.40  | 33.67  | 39.40  |        | 117   |
| 16                                      | 14.38 | 22.66  | 29.46  | 35.50  | 42.08  | 49.20  |        | 107   |
| 18                                      | 17.75 | 27.97  | 36.40  | 43.85  | 51.99  | 60.75  |        | 76    |
| 20                                      | 21.60 | 34.04  | 44.26  | 53.36  | 63.25  | 73.92  |        | 69    |
| 22                                      | 25.91 | 40.84  | 53.10  | 63.98  | 75.88  | 88.61  |        | 44    |
| 24                                      | 30.65 | 48.32  | 62.82  | 75.71  | 89.76  | 104.87 | 120.69 | 29    |
| 26                                      | 35.80 | 56.50  | 73.44  | 88.49  | 104.94 | 122.59 | 141.58 | 29    |
| 28                                      | 41.37 | 65.26  | 84.82  | 102.21 | 121.21 | 141.64 | 162.99 | 12    |
| 30                                      | 47.39 | 74.70  | 97.21  | 117.10 | 138.88 | 162.25 | 185.98 | 8     |
| 32                                      | 53.81 | 84.82  | 110.29 | 132.88 | 157.73 | 184.27 | 211.89 | 1     |
| 34                                      | 60.63 | 95.56  | 124.26 | 149.72 | 177.54 | 207.41 | 237.07 | 1     |
| 36                                      | 67.90 | 107.03 | 139.16 | 167.68 | 198.85 | 232.31 | 268.37 | 1     |
| Basis                                   | 6     | 120    | 175    | 134    | 130    | 75     | 18     | 658   |

Volume above stump, including peeled main stem only, to a top diameter of 4.0 inches. Merchantable height is determined by usable sawtimber top which is defined as the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 6.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.

WHITE PINE  
(Pinus strobus)

Wisconsin - Michigan

Peeled Merchantable Volume

1936

Gevorkiantz, Moser, and Danforth

Cubic Feet

| Merchantable Height, above stump - feet |       |       |        |        |        |        |        |        |        |       |
|-----------------------------------------|-------|-------|--------|--------|--------|--------|--------|--------|--------|-------|
| Diameter                                |       |       |        |        |        |        |        |        |        | Basis |
| Breast                                  | 10    | 20    | 30     | 40     | 50     | 60     | 70     | 80     | 90     |       |
| High                                    |       |       |        |        |        |        |        |        |        |       |
| Volume - cubic feet                     |       |       |        |        |        |        |        |        |        |       |
| Inches                                  |       |       |        |        |        |        |        |        |        | Trees |
| 10                                      | 5.17  | 9.93  | 14.20  | 17.44  | 19.67  |        |        |        |        | 44    |
| 12                                      | 6.95  | 13.30 | 19.01  | 23.42  | 26.40  | 29.30  | 32.34  | 35.90  | 39.20  | 44    |
| 14                                      | 8.80  | 16.91 | 24.16  | 29.75  | 33.49  | 37.23  | 41.08  | 45.61  | 49.80  | 39    |
| 16                                      | 11.03 | 21.12 | 30.20  | 37.18  | 41.86  | 46.57  | 51.33  | 57.03  | 62.33  | 33    |
| 18                                      | 13.60 | 26.09 | 37.31  | 45.90  | 51.67  | 57.49  | 63.41  | 70.46  | 76.91  | 31    |
| 20                                      | 16.56 | 31.73 | 45.37  | 55.88  | 63.25  | 69.96  | 77.15  | 85.70  | 93.63  | 22    |
| 22                                      |       | 38.08 | 54.42  | 67.04  | 75.53  | 82.84  | 92.57  | 102.77 | 112.31 | 16    |
| 24                                      |       | 45.05 | 64.40  | 79.25  | 89.31  | 99.24  | 109.45 | 121.59 | 132.86 | 10    |
| 26                                      |       | 52.86 | 75.29  | 92.70  | 104.44 | 116.04 | 128.01 | 142.17 | 155.29 | 12    |
| 28                                      |       | 60.82 | 86.94  | 107.01 | 120.56 | 134.08 | 147.82 | 164.18 | 179.35 | 1     |
| 30                                      |       | 69.64 | 99.62  | 122.65 | 138.17 | 153.62 | 169.36 | 188.08 | 205.53 | 1     |
| 32                                      |       | 79.08 | 113.03 | 139.21 | 156.93 | 174.39 | 192.36 | 213.57 | 232.95 | 1     |
| 34                                      |       | 89.09 | 127.34 | 156.77 | 176.57 | 196.53 | 216.66 | 240.64 | 262.87 | 3     |
| 36                                      |       | 99.78 | 142.62 | 175.64 | 197.82 | 219.91 | 242.51 | 269.55 | 294.50 |       |
| Basis                                   | 1     | 36    | 59     | 69     | 32     | 30     | 16     | 9      | 5      | 257   |

Volume above stump, including peeled main stem only, to a top diameter of 4.0 inches. Merchantable height is determined by usable sawtimber top which is defined as the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 6.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H.. 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.



WHITE PINE  
(*Pinus strobus*)

Wisconsin - Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

International  $\frac{1}{4}$ "

| Merchantable Height, above stump -- feet |    |     |     |     |     |      |      |      |      |       |
|------------------------------------------|----|-----|-----|-----|-----|------|------|------|------|-------|
| Diameter                                 |    |     |     |     |     |      |      |      |      | Basis |
| Breast                                   | 10 | 20  | 30  | 40  | 50  | 60   | 70   | 80   | 90   |       |
| High                                     |    |     |     |     |     |      |      |      |      |       |
| Volume - board feet                      |    |     |     |     |     |      |      |      |      |       |
| Inches                                   |    |     |     |     |     |      |      |      |      | Trees |
| 10                                       | 21 | 39  | 54  | 64  | 68  | 80   | 88   |      |      | 44    |
| 12                                       | 34 | 58  | 78  | 91  | 104 | 119  | 130  |      |      | 44    |
| 14                                       | 47 | 81  | 108 | 129 | 150 | 168  | 182  |      |      | 39    |
| 16                                       | 62 | 107 | 143 | 176 | 205 | 227  | 242  |      |      | 33    |
| 18                                       |    | 133 | 183 | 233 | 270 | 298  | 320  |      |      | 31    |
| 20                                       |    | 171 | 235 | 300 | 350 | 387  | 413  |      |      | 22    |
| 22                                       |    | 218 | 300 | 375 | 440 | 490  | 520  |      |      | 16    |
| 24                                       |    | 275 | 375 | 463 | 570 | 638  | 687  |      |      | 10    |
| 26                                       |    | 325 | 453 | 565 | 660 | 740  | 800  | 860  | 930  | 12    |
| 28                                       |    |     | 563 | 693 | 811 | 910  | 989  | 1055 | 1130 | 1     |
| 30                                       |    |     |     |     | 960 | 1080 | 1170 | 1240 | 1320 | 1     |
| 32                                       |    |     |     |     |     | 1260 | 1325 | 1445 | 1530 | 1     |
| 34                                       |    |     |     |     |     | 1450 | 1585 | 1705 | 1800 | 3     |
| Basis                                    | 1  | 36  | 59  | 69  | 32  | 30   | 16   | 9    | 5    | 257   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 6.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.



NORWAY PINE  
(*Pinus resinosa*)

Wisconsin Michigan

Volume In Board Feet

1936

Gevorkiantz, Moser, and Danforth

International  $\frac{1}{4}$ "

Merchantable Height, above stump - feet

| Diameter<br>Breast<br>High | 10 | 20 | 30 | 40 | 50 | 60 | 70 | Basis |
|----------------------------|----|----|----|----|----|----|----|-------|
|----------------------------|----|----|----|----|----|----|----|-------|

Volume board feet

| Inches |    |     |     |     |     |     |     | Trees |
|--------|----|-----|-----|-----|-----|-----|-----|-------|
| 10     | 19 | 37  | 49  | 59  |     |     |     | 20    |
| 12     | 29 | 51  | 71  | 80  | 93  | 106 |     | 19    |
| 14     | 44 | 76  | 102 | 121 | 140 | 158 |     | 27    |
| 16     | 61 | 105 | 141 | 172 | 200 | 223 | 239 | 32    |
| 18     |    | 130 | 181 | 229 | 267 | 295 | 315 | 30    |
| 20     |    | 167 | 230 | 292 | 342 | 375 | 401 | 23    |
| 22     |    | 210 | 273 | 365 | 425 | 472 | 501 | 1     |
| 24     |    |     | 365 | 450 | 528 | 590 | 634 | 1     |
| 26     |    |     |     | 560 | 655 | 733 | 790 | 1     |
| 28     |    |     |     | 680 | 798 | 895 | 970 |       |
| Basis  | 1  | 29  | 58  | 50  | 12  | 4   |     | 154   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 6.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H., 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.

NORWAY PINE  
(*Pinus resinosa*)

Wisconsin - Michigan

Peeled Merchantable Volume

1936

Gevorkiantz, Moser, and Danforth

Cubic Feet

| Merchantable Height, above stump - feet |       |       |       |       |        |        |        | Basis |
|-----------------------------------------|-------|-------|-------|-------|--------|--------|--------|-------|
| Diameter<br>Breast<br>High              | 10    | 20    | 30    | 40    | 50     | 60     | 70     |       |
| Volume - cubic feet                     |       |       |       |       |        |        |        |       |
| Inches                                  |       |       |       |       |        |        |        | Trees |
| 10                                      | 5.44  | 9.47  | 12.85 | 16.05 | 19.29  | 21.90  | 24.83  | 20    |
| 12                                      | 7.30  | 12.67 | 17.21 | 21.50 | 25.80  | 29.30  | 33.26  | 19    |
| 14                                      | 9.27  | 16.11 | 21.84 | 27.28 | 32.82  | 37.23  | 42.26  | 27    |
| 16                                      | 11.59 | 20.13 | 27.30 | 34.13 | 41.00  | 46.57  | 52.83  | 32    |
| 18                                      | 14.32 | 24.87 | 33.73 | 42.17 | 50.63  | 57.49  | 65.24  | 30    |
| 20                                      | 17.41 | 30.25 | 41.04 | 51.30 | 61.60  | 69.96  | 79.39  | 23    |
| 22                                      | 20.90 | 36.28 | 49.24 | 61.52 | 73.84  | 83.95  | 95.15  | 1     |
| 24                                      | 24.72 | 42.94 | 58.25 | 72.79 | 87.38  | 99.24  | 112.65 | 1     |
| 26                                      | 28.89 | 50.20 | 68.13 | 85.05 | 102.16 | 116.04 | 131.69 | 1     |
| 28                                      | 33.38 | 57.96 | 78.68 | 98.26 | 118.04 | 134.08 | 152.13 |       |
| Basis                                   | 1     | 29    | 58    | 50    | 12     | 4      |        | 154   |

Volume above stump, including peeled main stem only, to a top diameter of 4.0 inches. Merchantable height is determined by usable sawtimber top which is defined as the point on the stem at which merchantability for sawtimber is limited by branches, deformity, defect or by a diameter of less than 6.0 inches.

Stump height 1 foot for trees up to 18 inches D.B.H.. 2 feet over 18 inches D.B.H.

Compiled by the Lake States Forest Experiment Station from data collected on the Forest Survey of the Lake States. The table gives average values based on measurement of trees throughout Wisconsin and northern Michigan.

Block indicates extent of original data.

Volume Tables for Important Timber Species  
in Kansas

- - - - -

1. Board feet, Scribner Decimal C log rule.
2. Total cubic feet (peeled merchantable volume).<sup>1/</sup>

- - - - -

|                           |              |
|---------------------------|--------------|
| American and slippery elm | Cottonwood   |
| Red and pin oak           | Hackberry    |
| Bur oak                   | Black walnut |
| Post oak                  | Hickories    |
| Green and white ash       | Sycamore     |

The volume tables for Kansas were prepared by E. R. Ware and Frank E. Westlund, working under the direction of the Lake States Forest Experiment Station. Karl F. Ziegler and Aubrey E. Davidson of the Prairie States Forestry Project and Kenneth Hougland assisted in the collection of the field data.

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<sup>1/</sup> The total-cubic-foot tables include the peeled merchantable volume between stump and 4-inch top together with limb wood to 4-inch limit.

American and Slippery Elm  
(*Ulmus Americana* and *Ulmus fulva*)

Kansas

Total Cubic Foot Volume

1936

Gevorkiantz

Ware

Westlund

Cubic feet

| Merchantable Height, above stump - feet |       |       |       |       |       | Basis |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|
| Diameter<br>Breast<br>High              | 10    | 20    | 30    | 40    | 50    |       |
| Volume - cubic feet                     |       |       |       |       |       |       |
| Inches                                  |       |       |       |       |       | Trees |
| 10                                      | 9.4   | 12.1  |       |       |       | 1     |
| 12                                      | 14.9  | 18.6  |       |       |       | 18    |
| 14                                      | 22.8  | 26.3  | 31.3  |       |       | 16    |
| 16                                      | 31.7  | 37.4  | 42.5  |       |       | 20    |
| 18                                      | 42.2  | 49.7  | 55.8  | 60.6  |       | 17    |
| 20                                      | 55.3  | 64.5  | 71.6  | 76.2  |       | 11    |
| 22                                      | 69.0  | 80.5  | 89.1  | 95.1  | 99.8  | 8     |
| 24                                      | 86.2  | 98.9  | 108.7 | 115.8 | 120.1 | 4     |
| 26                                      | 103.9 | 119.0 | 130.3 | 137.9 | 142.7 | 2     |
| 28                                      | 124.3 | 141.5 | 154.5 | 161.7 | 167.8 | 1     |
| 30                                      | 145.9 | 165.8 | 180.5 | 188.9 | 195.0 | 4     |
| 32                                      | 170.5 | 192.8 | 208.8 | 217.6 | 224.4 | 2     |
| 34                                      | 195.4 | 220.5 | 239.5 | 249.0 | 255.7 |       |
| 36                                      | 223.5 | 252.4 | 272.5 | 282.0 | 288.9 | 2     |
| 38                                      | 252.8 | 284.2 | 308.2 | 316.9 | 323.6 |       |
| Basis                                   | 55    | 40    | 10    |       | 1     | 106   |

The table gives average gross values of trees at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

The table presents volume of the merchantable stem and branches, excluding bark, to a 4 inch top inside bark.

Stump height 1.0 to 3.5 feet, average 1.7 feet.

Compiled by the Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  14.20 percent.

AMERICAN AND SLIPPERY ELM  
(Ulmus Americana and Ulmus fulva)

Kansas

Volume in Board Feet

1936

Cevorkiantz

Ware

Westlund

Scribner

Merchantable Height, above stump - feet

| Diameter |    |    |    |    |    | Basis |
|----------|----|----|----|----|----|-------|
| Breast   |    |    |    |    |    |       |
| High     | 10 | 20 | 30 | 40 | 50 |       |

Volume - board feet

| Inches |     |     |      |      |      | Trees |
|--------|-----|-----|------|------|------|-------|
| 10     | 16  | 32  |      |      |      | 1     |
| 12     | 31  | 54  |      |      |      | 18    |
| 14     | 49  | 84  | 112  |      |      | 16    |
| 16     | 67  | 115 | 158  |      |      | 20    |
| 18     | 87  | 157 | 212  | 267  |      | 17    |
| 20     | 112 | 202 | 280  | 348  |      | 11    |
| 22     | 142 | 258 | 354  | 438  | 515  | 8     |
| 24     | 178 | 313 | 439  | 538  | 635  | 4     |
| 26     | 220 | 377 | 524  | 650  | 762  | 2     |
| 28     | 267 | 452 | 625  | 778  | 909  | 1     |
| 30     | 315 | 529 | 730  | 906  | 1058 | 4     |
| 32     | 366 | 611 | 842  | 1037 | 1209 | 2     |
| 34     | 423 | 700 | 960  | 1180 | 1373 |       |
| 36     | 484 | 794 | 1085 | 1328 | 1546 | 2     |
| 38     | 547 | 891 | 1212 | 1481 | 1722 |       |
| Basis  | 55  | 40  | 10   |      | 1    | 106   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity or defect. The average top diameter of the last sawlog is approximately 78 percent of the dbh.

The table gives average gross values of sawlogs cut at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

Stump height 1.0 to 3.5 feet, average 1.7 feet.

Compiled by the Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  12.09 percent.



# RED AND PIN OAK

(*Quercus borealis maxima* and *Quercus palustris*)

Kansas

Volume in Board Feet

1936

Gevorkiantz

Ware

Westlund

Scribner

|                      |     | Merchantable Height, above stump .. feet |     |      |      |      |    |       |
|----------------------|-----|------------------------------------------|-----|------|------|------|----|-------|
| Diameter             |     |                                          |     |      |      |      |    | Basis |
| Breast               |     |                                          |     |      |      |      |    |       |
| High                 |     | 10                                       | 20  | 30   | 40   | 50   | 60 |       |
| Volume .. board feet |     |                                          |     |      |      |      |    |       |
| Inches               |     |                                          |     |      |      |      |    | Trees |
| 10                   | 18  | 34                                       | 46  |      |      |      |    | 3     |
| 12                   | 32  | 56                                       | 74  | 87   |      |      |    | 19    |
| 14                   | 49  | 84                                       | 112 | 134  |      |      |    | 64    |
| 16                   | 65  | 113                                      | 155 | 195  | 227  |      |    | 61    |
| 18                   | 83  | 145                                      | 200 | 255  | 298  | 328  |    | 51    |
| 20                   | 103 | 183                                      | 256 | 323  | 378  | 417  |    | 43    |
| 22                   | 129 | 233                                      | 320 | 400  | 468  | 520  |    | 31    |
| 24                   | 160 | 282                                      | 396 | 488  | 575  | 640  |    | 18    |
| 26                   | 195 | 340                                      | 472 | 585  | 687  | 770  |    | 9     |
| 28                   | 235 | 404                                      | 560 | 695  | 815  | 915  |    | 7     |
| 30                   | 278 | 470                                      | 650 | 810  | 945  | 1060 |    | 3     |
| 32                   | 323 | 545                                      | 752 | 930  | 1085 | 1220 |    |       |
| 34                   |     | 620                                      | 852 | 1050 | 1225 | 1375 |    | 1     |
| Basis                |     | 70                                       | 136 | 81   | 21   |      | 2  | 310   |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, or defect. The average top diameter of the last sawlog is approximately 75 percent of the dbh.

The table gives average gross values of sawlogs cut at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

Stump height 1.0 to 3.5 feet. Average 1.8 feet.

Compiled by the Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Aggregate deviation .77 percent.

Average deviation  $\pm$  12.76 percent.

BURR OAK  
(*Quercus macrocarpa*)

Kansas

Total Cubic Foot Volume

1936

Gevorkiantz

Ware

Westlund

Cubic feet

| Merchantable Height, above stump - feet |       |       |       |       |       |       |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|
| Diameter                                | 10    | 20    | 30    | 40    | 50    | Basis |
| Breast                                  |       |       |       |       |       |       |
| High                                    |       |       |       |       |       |       |
| Volume - Cubic feet                     |       |       |       |       |       |       |
| Inches                                  |       |       |       |       |       | Trees |
| 10                                      | 6.9   | 9.6   |       |       |       | 3     |
| 12                                      | 12.2  | 15.8  | 18.7  |       |       | 13    |
| 14                                      | 19.4  | 24.2  | 28.0  |       |       | 23    |
| 16                                      | 27.2  | 34.7  | 39.6  | 43.5  |       | 12    |
| 18                                      | 37.6  | 46.3  | 52.6  | 58.3  | 61.0  | 14    |
| 20                                      | 48.3  | 59.4  | 67.8  | 74.1  | 78.2  | 18    |
| 22                                      | 59.8  | 73.5  | 84.1  | 92.2  | 97.0  | 9     |
| 24                                      | 71.6  | 88.5  | 101.5 | 111.1 | 117.9 | 10    |
| 26                                      | 84.3  | 104.2 | 120.3 | 131.9 | 139.7 | 2     |
| 28                                      | 97.9  | 121.1 | 139.7 | 153.8 | 162.8 | 1     |
| 30                                      | 112.1 | 139.2 | 160.8 | 176.6 | 187.8 | 2     |
| 32                                      | 127.2 | 158.0 | 182.8 | 200.9 | 214.0 |       |
| 34                                      |       | 178.1 | 207.0 | 226.7 | 241.5 |       |
| 36                                      |       |       | 231.7 | 253.8 | 270.2 | 1     |
| Basis                                   | 46    | 42    | 16    | 4     |       | 108   |

The table gives average gross values of trees at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

The table presents volume of the merchantable stem and branches, excluding bark, to a 4 inch top inside bark.

Stump height 0.5 to 4.3 feet, average 1.6 feet.

Compiled by Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  14.59 percent.

BURR OAK  
(*Quercus macrocarpa*)

Kansas

Volume in Board Feet

1936

Gevorkiantz

Ware

Westlund

Scribner

|                     |     | Merchantable Height, above stump - feet |     |      |      |    |       |
|---------------------|-----|-----------------------------------------|-----|------|------|----|-------|
| Diameter            |     |                                         |     |      |      |    | Basis |
| Breast              |     |                                         |     |      |      |    |       |
| High                |     | 10                                      | 20  | 30   | 40   | 50 |       |
| Volume - board feet |     |                                         |     |      |      |    |       |
| Inches              |     |                                         |     |      |      |    | Trees |
| 10                  | 16  | 32                                      |     |      |      |    | 3     |
| 12                  | 30  | 52                                      | 69  |      |      |    | 13    |
| 14                  | 46  | 80                                      | 106 |      |      |    | 23    |
| 16                  | 64  | 110                                     | 150 | 193  |      |    | 12    |
| 18                  | 80  | 140                                     | 192 | 245  | 287  |    | 14    |
| 20                  | 100 | 179                                     | 247 | 311  | 365  |    | 18    |
| 22                  | 125 | 228                                     | 315 | 391  | 458  |    | 9     |
| 24                  | 152 | 278                                     | 381 | 468  | 552  |    | 10    |
| 26                  | 185 | 329                                     | 460 | 562  | 663  |    | 2     |
| 28                  | 228 | 390                                     | 542 | 673  | 788  |    | 1     |
| 30                  | 268 | 457                                     | 630 | 785  | 915  |    | 2     |
| 32                  | 310 | 526                                     | 726 | 900  | 1050 |    |       |
| 34                  |     | 602                                     | 830 | 1025 | 1195 |    |       |
| 36                  |     |                                         | 933 | 1147 | 1334 |    | 1     |
| Basis               |     | 46                                      | 42  | 16   | 4    |    | 108   |

Volume above stump to usable top. i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, or defect. The average top diameter of the last sawlog is approximately 72 percent of the dbh.

The table gives average gross values of sawlogs cut at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

Stump height 0.5 to 4.3 feet, average 1.6 feet.

Compiled by the Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  14.93 percent.

POST OAK  
(*Quercus stellata*)

Kansas

Total Cubic Foot Volume

1936

Gevorkiantz

Ware

Westlund

Cubic feet

| Diameter            |      | Merchantable Height, above stump - feet |       |    | Basis |
|---------------------|------|-----------------------------------------|-------|----|-------|
| Breast              | High | 10                                      | 20    | 30 |       |
| Volume - Cubic feet |      |                                         |       |    |       |
| Inches              |      |                                         |       |    | Trees |
| 10                  | 5.8  | 8.5                                     |       |    | 4     |
| 12                  | 10.5 | 14.1                                    |       |    | 12    |
| 14                  | 17.2 | 21.4                                    | 25.3  |    | 15    |
| 16                  | 25.7 | 31.1                                    | 35.5  |    | 10    |
| 18                  | 36.4 | 42.6                                    | 48.1  |    | 5     |
| 20                  | 47.4 | 55.2                                    | 62.0  |    | 2     |
| 22                  | 58.7 | 68.9                                    | 77.2  |    | 1     |
| 24                  | 70.0 | 82.7                                    | 92.8  |    |       |
| 26                  | 81.8 | 96.8                                    | 109.1 |    | 1     |
| Basis               | 38   | 12                                      |       |    | 50    |

The table gives average gross values of trees at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

The table presents volume of the merchantable stem and branches, excluding bark, to a 4 inch top inside bark.

Stump height 1.0 to 3.0 feet, average 1.5 feet.

Compiled by Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  17.61 percent.

POST OAK  
(*Quercus stellata*)

Kansas

Volume in Board Feet

1936

Gevorkiantz  
Ware  
Westlund

Scribner

| Merchantable Height, above stump - feet |     |     |     | Basis |
|-----------------------------------------|-----|-----|-----|-------|
| Diameter                                | 10  | 20  | 30  |       |
| Breast                                  |     |     |     |       |
| High                                    |     |     |     |       |
| Volume - board feet                     |     |     |     |       |
| Inches                                  |     |     |     | Trees |
| 10                                      | 17  | 33  |     | 7     |
| 12                                      | 30  | 52  |     | 13    |
| 14                                      | 45  | 77  | 101 | 16    |
| 16                                      | 62  | 106 | 143 | 10    |
| 18                                      | 77  | 135 | 184 | 5     |
| 20                                      | 96  | 172 | 237 | 2     |
| 22                                      | 118 | 214 | 296 | 1     |
| 24                                      | 150 | 264 | 362 |       |
| 26                                      | 179 | 319 | 435 | 1     |
| Basis                                   | 43  | 12  |     | 55    |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, or defect. The average top diameter of the last sawlog is approximately 78 percent of the dbh.

The table gives average gross values of sawlogs cut at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

Stump height 1.0 to 3.0 feet, average 1.5 feet.

Compiled by the Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  13.68 percent.



GREEN AND WHITE ASH  
(*Fraxinus pennsylvanica lanceolata* and *Fraxinus americana*)

Kansas

Volume in Board Feet

1936

Gevorkiantz

Ware

Westlund

Scribner

Merchantable Height, above stump - feet

| Diameter<br>Breast<br>High | 10 | 20 | 30 | 40 | 50 | Basis |
|----------------------------|----|----|----|----|----|-------|
|----------------------------|----|----|----|----|----|-------|

Volume - board feet

| Inches |     |     |     |     |     | Trees |
|--------|-----|-----|-----|-----|-----|-------|
| 10     | 16  | 32  |     |     |     | 3     |
| 12     | 30  | 53  |     |     |     | 2     |
| 14     | 47  | 81  | 108 |     |     | 6     |
| 16     | 65  | 113 | 152 |     |     | 11    |
| 18     | 82  | 143 | 198 | 251 |     | 15    |
| 20     | 102 | 183 | 253 | 319 |     | 6     |
| 22     | 127 | 230 | 317 | 395 | 464 | 3     |
| 24     | 156 | 277 | 388 | 478 | 563 | 1     |
| 26     |     | 330 | 460 | 563 | 664 |       |
| 28     |     | 387 | 537 | 668 | 780 | 1     |
| Basis  | 14  | 11  | 19  | 4   |     | 48    |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity or defect. The average top diameter of the last sawlog is approximately 71 percent of the dbh.

The table gives average gross values of sawlogs cut at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

Stump height 0.5 to 2.4 feet, average 1.5 feet.

Compiled by the Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  11.91 percent.



COTTONWOOD  
(*Populus deltoides virginiana*)

Kansas

Volume in Board Feet

1936

Gevorkiantz

Ware

Westlund

Scribner

| Merchantable Height, above stump - feet |     |     |      |      |      |      |      |       |
|-----------------------------------------|-----|-----|------|------|------|------|------|-------|
| Diameter                                |     |     |      |      |      |      |      | Basis |
| Breast                                  | 10  | 20  | 30   | 40   | 50   | 60   | 70   |       |
| High                                    |     |     |      |      |      |      |      |       |
| Volume - board feet                     |     |     |      |      |      |      |      |       |
| Inches                                  |     |     |      |      |      |      |      | Trees |
| 10                                      | 17  | 34  |      |      |      |      |      | 1     |
| 12                                      | 34  | 60  | 79   | 93   |      |      |      | 1     |
| 14                                      | 54  | 92  | 123  | 148  |      |      |      | 4     |
| 16                                      | 70  | 122 | 165  | 210  | 246  |      |      | 10    |
| 18                                      | 88  | 155 | 213  | 272  | 317  |      |      | 16    |
| 20                                      | 110 | 197 | 272  | 343  | 400  | 443  |      | 10    |
| 22                                      | 135 | 243 | 335  | 417  | 490  | 545  | 580  | 13    |
| 24                                      | 163 | 288 | 405  | 497  | 585  | 654  | 703  | 7     |
| 26                                      | 195 | 340 | 475  | 586  | 688  | 770  | 830  | 6     |
| 28                                      | 233 | 400 | 555  | 690  | 810  | 908  | 982  | 4     |
| 30                                      | 275 | 467 | 645  | 802  | 937  | 1052 | 1143 | 3     |
| 32                                      | 320 | 540 | 745  | 925  | 1075 | 1213 | 1320 | 2     |
| 34                                      | 370 | 620 | 852  | 1050 | 1223 | 1375 | 1500 | 1     |
| 36                                      | 427 | 705 | 965  | 1187 | 1383 | 1555 | 1700 | 2     |
| 38                                      |     | 795 | 1082 | 1330 | 1547 | 1740 | 1905 |       |
| Basis                                   | 4   | 15  | 29   | 17   | 11   | 3    | 1    | 80    |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, or defect. The average top diameter of the last sawlog is approximately 65 percent of the dbh.

The table gives average gross values of sawlogs cut at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

Stump height 0.3 to 4.5 feet, average 1.3 feet.

Compiled by the Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  9.93 percent.



HACKBERRY  
(*Celtis occidentalis*)

Kansas

Volume in Board Feet

1936

Gevorkiantz  
Ware  
Westlund

Scribner

|                     |     | Merchantable Height, above stump .. feet |     |     |    |       |
|---------------------|-----|------------------------------------------|-----|-----|----|-------|
| Diameter            |     |                                          |     |     |    | Basis |
| Breast              |     |                                          |     |     |    |       |
| High                |     | 10                                       | 20  | 30  | 40 |       |
| Volume - board feet |     |                                          |     |     |    |       |
| Inches              |     |                                          |     |     |    | Trees |
| 10                  | 17  | 33                                       |     |     |    | 1     |
| 12                  | 32  | 55                                       |     |     |    | 2     |
| 14                  | 49  | 83                                       | 111 |     |    | 7     |
| 16                  | 65  | 112                                      | 148 |     |    | 6     |
| 18                  | 81  | 142                                      | 194 | 248 |    | 5     |
| 20                  | 100 | 180                                      | 248 | 313 |    | 2     |
| 22                  | 124 | 225                                      | 310 | 387 |    | 8     |
| 24                  | 153 | 271                                      | 381 | 469 |    |       |
| 26                  | 184 | 323                                      | 453 | 554 |    |       |
| 28                  |     | 380                                      | 528 | 657 |    |       |
| 30                  |     |                                          | 616 | 767 |    | 1     |
| Basis               | 11  | 15                                       | 6   |     |    | 32    |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity or defect. The average top diameter for the last sawlog is approximately 68 percent of the dbh.

The table gives average gross values of sawlogs cut at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

Stump height 0.5 to 3.5 feet, average 1.7 feet.

Compiled by the Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  11.50 percent.

BLACK WALNUT  
(Juglans nigra)

Kansas

Total Cubic Foot Volume

1936

Gevorkiantz

Ware

Westlund

Cubic feet

| Merchantable Height, above stump - feet |      |      |      |      |       |
|-----------------------------------------|------|------|------|------|-------|
| Diameter                                |      |      |      |      | Basis |
| Breast                                  |      |      |      |      |       |
| High                                    | 10   | 20   | 30   | 40   |       |
| Volume - cubic feet                     |      |      |      |      |       |
| Inches                                  |      |      |      |      | Trees |
| 10                                      | 9.2  | 11.5 | 13.6 |      | 3     |
| 12                                      | 13.7 | 17.5 | 20.4 | 22.8 | 10    |
| 14                                      | 19.3 | 24.4 | 28.7 | 31.7 | 27    |
| 16                                      | 25.6 | 32.5 | 38.0 | 42.2 | 39    |
| 18                                      | 33.0 | 42.0 | 49.1 | 54.2 | 48    |
| 20                                      | 41.2 | 52.5 | 61.7 | 67.9 | 14    |
| 22                                      | 50.5 | 64.3 | 75.4 | 83.2 | 7     |
| 24                                      | 60.4 | 77.0 | 90.3 | 99.5 |       |
| Basis                                   | 40   | 56   | 38   | 14   | 148   |

The table gives average gross values of sawlogs at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

The table presents volume of the merchantable stem and branches, excluding bark, to a 4 inch top inside bark.

Stump height 0.2 to 3.5 feet, average 1 foot.

Volume in stumps grubbed out is not included in the table. Average cubic foot volume in grubbed out stumps by d.b.h. classes: 16 inch, 4.1; 18 inch, 4.6; 20 inch, 5.3; 22 inch, 5.6. One-fourth of the trees measured had stumps grubbed out.

Compiled by Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  12.50 percent.



HICKORIES  
(Hicoria sp.)

Kansas

Total Cubic Foot Volume

1936

Gevorkiantz

Ware

Westlund

Cubic feet

| Merchantable Height, above stump - feet |       |       |       |       | Basis |
|-----------------------------------------|-------|-------|-------|-------|-------|
| Diameter                                |       |       |       |       |       |
| Breast<br>High                          | 10    | 20    | 30    | 40    |       |
| Volume - cubic feet                     |       |       |       |       |       |
| Inches                                  |       |       |       |       | Trees |
| 10                                      | 7.6   | 10.3  |       |       | 5     |
| 12                                      | 13.3  | 16.7  |       |       | 4     |
| 14                                      | 20.4  | 25.1  | 28.5  |       | 8     |
| 16                                      | 29.1  | 35.6  | 39.8  |       | 6     |
| 18                                      | 39.2  | 47.5  | 52.8  | 57.1  | 8     |
| 20                                      | 51.0  | 61.1  | 67.5  | 73.0  | 10    |
| 22                                      | 63.7  | 76.2  | 84.2  | 90.5  | 5     |
| 24                                      | 77.8  | 91.9  | 102.3 | 110.0 | 3     |
| 26                                      | 92.9  | 109.8 | 121.7 | 131.0 | 1     |
| 28                                      | 108.5 | 128.5 | 142.7 | 154.0 | 2     |
| 30                                      |       | 147.5 | 164.1 | 178.1 |       |
| 32                                      |       | 165.9 | 186.1 | 203.4 | 1     |
| Basis                                   | 18    | 26    | 8     | 1     | 53    |

The table gives average gross values of trees at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

The table presents volume of the merchantable stem and branches, excluding bark, to a 4 inch top inside bark.

Stump height 0.9 to 3.5 feet, average 1.8 feet.

Compiled by the Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  13.98 percent.

HICKORIES  
(Hicoria, spp.)

Kansas

Volume in Board Feet

1936

Gevorkiantz  
Ware  
Westlund

Scribner

| Merchantable Height, above stump    feet |     |     |     |     |       |
|------------------------------------------|-----|-----|-----|-----|-------|
| Diameter                                 |     |     |     |     | Basis |
| Breast                                   |     |     |     |     |       |
| High                                     | 10  | 20  | 30  | 40  |       |
| Volume -- board feet                     |     |     |     |     |       |
| Inches                                   |     |     |     |     | Trees |
| 10                                       | 17  | 33  |     |     | 5     |
| 12                                       | 30  | 53  |     |     | 4     |
| 14                                       | 47  | 81  | 108 |     | 8     |
| 16                                       | 65  | 111 | 150 |     | 6     |
| 18                                       | 80  | 138 | 190 | 242 | 8     |
| 20                                       | 98  | 177 | 243 | 308 | 10    |
| 22                                       | 122 | 219 | 303 | 378 | 5     |
| 24                                       | 148 | 268 | 369 | 457 | 3     |
| 26                                       | 177 | 322 | 440 | 538 | 1     |
| 28                                       | 212 | 367 | 510 | 633 | 2     |
| 30                                       |     | 423 | 588 | 730 |       |
| 32                                       |     | 484 | 670 | 834 | 1     |
| Basis                                    | 18  | 26  | 8   | 1   | 53    |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, or defect. The average top diameter of the last sawlog is approximately 72 percent of the dbh.

The table gives average gross values of sawlogs cut at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

Stump height 0.9 to 3.5 feet, average 1.8 feet.

Compiled by the Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  14.36 percent.

SYCAMORE  
(Platanus occidentalis)

Kansas

Total Cubic Foot Volume

1936

Gevorkiantz

Ware

Westlund

Cubic feet

| Diameter            |      | Merchantable Height, above stump - feet |       |       |       |  | Basis |  |
|---------------------|------|-----------------------------------------|-------|-------|-------|--|-------|--|
| Breast              |      |                                         |       |       |       |  |       |  |
| High                | 10   | 20                                      | 30    | 40    | 50    |  |       |  |
| Volume - Cubic feet |      |                                         |       |       |       |  |       |  |
| Inches              |      |                                         |       |       |       |  | Trees |  |
| 10                  | 10.7 | 13.2                                    |       |       |       |  |       |  |
| 12                  | 16.4 | 20.2                                    | 22.9  |       |       |  | 1     |  |
| 14                  | 23.4 | 28.6                                    | 32.3  |       |       |  |       |  |
| 16                  | 32.2 | 38.6                                    | 43.8  |       |       |  | 2     |  |
| 18                  | 42.7 | 50.8                                    | 57.1  | 62.9  |       |  | 2     |  |
| 20                  | 55.0 | 64.9                                    | 72.6  | 79.7  |       |  | 2     |  |
| 22                  | 68.8 | 81.3                                    | 90.7  | 99.1  | 103.9 |  | 4     |  |
| 24                  | 85.2 | 100.0                                   | 110.5 | 120.9 | 126.7 |  | 7     |  |
| 26                  |      | 120.1                                   | 133.2 | 144.8 | 150.9 |  | 4     |  |
| 28                  |      | 143.0                                   | 157.8 | 171.1 | 177.5 |  | 3     |  |
| 30                  |      | 166.7                                   | 184.3 | 199.5 | 206.8 |  | 3     |  |
| 32                  |      | 192.5                                   | 211.8 | 229.7 | 237.7 |  | 1     |  |
| Basis               |      | 11                                      | 11    | 6     | 1     |  | 29    |  |

The table gives average gross values of trees at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

The table presents volume of the merchantable stem and branches, excluding bark, to a 4 inch top inside bark.

Stump height 0.5 to 4.5 feet, average 2 feet.

Compiled by Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  14.00 percent.

SYCAMORE  
(Platanus occidentalis)

Kansas

Volume in Board Feet

1936

Gevorkiantz  
Ware  
Westlund

Scribner

| Merchantable Height, above stump - feet |     |     |     |     |      | Basis |
|-----------------------------------------|-----|-----|-----|-----|------|-------|
| Diameter                                |     |     |     |     |      |       |
| Breast<br>High                          | 10  | 20  | 30  | 40  | 50   |       |
| Volume - board feet                     |     |     |     |     |      |       |
| Inches                                  |     |     |     |     |      | Trees |
| 10                                      | 18  | 35  |     |     |      |       |
| 12                                      | 33  | 57  | 76  |     |      | 1     |
| 14                                      | 50  | 86  | 114 |     |      |       |
| 16                                      | 67  | 117 | 160 |     |      | 2     |
| 18                                      | 86  | 152 | 208 | 264 |      | 2     |
| 20                                      | 109 | 198 | 272 | 343 |      | 2     |
| 22                                      | 137 | 248 | 343 | 425 | 500  | 4     |
| 24                                      | 169 | 298 | 414 | 514 | 607  | 7     |
| 26                                      |     | 358 | 497 | 618 | 723  | 4     |
| 28                                      |     | 423 | 587 | 730 | 853  | 3     |
| 30                                      |     | 495 | 685 | 852 | 994  | 3     |
| 32                                      |     | 572 | 788 | 977 | 1138 | 1     |
| Basis                                   |     | 11  | 11  | 6   | 1    | 29    |

Volume above stump to usable top, i.e., the point on the stem at which merchantability for sawtimber is limited by branches, deformity, or defect. The average top diameter for the last sawlog is approximately 70 percent of the dbh.

The table gives a average gross values of sawlogs cut at logging operations in southeastern Kansas. No allowance has been made for woods or mill cull.

Stump height 0.5 to 4.5 feet, average 2 feet.

Compiled by the Lake States Forest Experiment Station from data collected on the forest survey of Kansas.

Block indicates extent of original data.

Average deviation  $\pm$  12.37 percent.

